CLAIMS:

(amended claims of January 19, 2001)

1. A method for determining the chemosensitivity of cells towards at least one substance by measuring the apoptosis induced by said at least one substance avoiding serial tests, wherein the cells are incubated essentially concurrently with at least one marker whose specific binding capability to phosphatidylserine can be detected and with said at least one substance, and the binding between the marker and phosphatidylserine is detected in a time-resolved manner.

2. The method according to claim 1, characterized in that said at least one marker together with said at least one substance is added prior to and/or during the incubation of the cells.

3. The method according to claim 1 and/or 2, wherein said cells are animal, including human, cells, especially leukemia cells, cells of solid tumors, cells of pathological organs, and/or reference cells, such as cells from organs other than the pathological ones, or cells from healthy regions of pathological organs.

4. The method according to any of claims 1 to 3, characterized in that a reference measurement is performed without the addition of said at least one substance.

5. The method according to any of claims 1 to 4, characterized in that pharmaceutically active substances, chemotherapeutic agents, environmental pollutants, peptides, nucleic acids or derivatives thereof, PNAs and/or nucleic acid hybrids are employed as said substances.

6. The method according to any of claims 1 to 5, characterized in that antibodies, F_{ab} fragments, single-chain antibodies, aptamers and/or other proteins having binding sites for phosphatidylserine are employed as said markers.

7. The method according to any of claims 1 to 6, characterized in that said marker comprises a dye portion, a colloidal precious metal, a radioactive isotope, and/or rare-earth metal chelates.

8. The method according to any of claims 1 to 7, characterized in that apoptotic cells are distinguished from necrotic cells, especially by co-incubation with a marker for necrotic cells, especially with a dye interacting with nucleic acids which cannot permeate intact cell membranes.

9. The method according to any of claims 1 to 8, characterized in that imaging methods, such as fluorescence detection methods, especially methods based on confocal or conventional microscopy, are employed for detection.

10. The method according to any of claims 1 to 9, characterized in that the number of cells identified as apoptotic is standardized for the total number of the cells.

11. The method according to any of claims 1 to 10, characterized in that the detection is performed with a time resolution of hours or at greater time intervals.

12. The method according to any of claims 1 to 11, characterized in that annexin V is used as the marker in the presence of calcium in a concentration range of from 0.1 to 30 mM, preferably from 1 to 10 mM.

13. The method according to any of claims 1 to 12 used for the screening for apoptotically effective substances.

14. Use of a kit containing at least one cytostatic agent and at least one marker whose interaction with phosphatidylserine can be detected, said substances being present as dry substances, in solution, or in the presence of matrix substances, in a method according to any of claims 1 to 13 for determining the chemosensitivity of cells towards at least one substance.